

Claims 1-3, 6 and 7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Matsunaga et al.

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nashimoto in view of Kim.

It is submitted that the claims, as amended, are neither anticipated by, within the meaning of 35 U.S.C. § 102, nor obvious from, within the meaning of 35 U.S.C. § 103, the cited art.

Specifically, the invention relates to a multilayer thin film formed on an Si substrate by epitaxial growth, which comprises: a buffer layer formed on said Si substrate, which buffer layer includes an oxide thin film of zirconium or a rare earth element, a perovskite oxide thin film formed on said buffer layer, which film has a (100) or (001) orientation, and a ferroelectric thin film epitaxially grown on said perovskite oxide thin film.

Since the ferroelectric thin film is formed using a buffer layer as defined and a primer layer of a perovskite oxide, such multilayer thin film has significantly superior properties and characteristics. Specifically, when a pattern is formed by processing or removing the buffer layer by etching or the like, it is possible to enhance the crystallographic properties of the ferroelectric thin film or inhibit the formation of a pyrochlore phase at buffer layer-free sites by using for the perovskite oxide thin film a PbTiO_3 or other material capable of providing perovskite structure crystals more easily as compared with PZT.

A claimed feature neither taught nor suggested by any of the references relied upon by the Examiner is that the buffer layer formed on the Si substrate comprises an oxide thin film of zirconium or of a rare earth element. Manifestly, neither Matsunaga et al nor Nashimoto nor Kim disclose such a buffer layer. The silicon dioxide layer of Matsunaga et al or of Kim, or the magnesium oxide and magnesium aluminate layers of Nashimoto clearly

clearly do not make obvious a buffer layer as now defined in the claims, such buffer layer manifestly not being taught by the references. Thus, even if the references are combined, Applicants' discovery is not made obvious thereby.

Accordingly, withdrawal of the rejection of the claims under 35 U.S.C. § 102 and § 103 is requested.

It is submitted that this application is now in condition for allowance and which is solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Samuel H. Blech
Registration No. 32,082



22850

(703) 413-3000
Fax No.: (703)413-2220
NFO:SHB/cja
I:\atty\SHB\206645US-am2.wpd

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IN THE CLAIMS

--1. (Twice Amended) A multilayer thin film formed on an Si substrate by epitaxial growth, which comprises:

a buffer layer formed on said Si substrate, which [said] buffer layer includes an oxide thin film of zirconium or of a rare earth element,

a perovskite oxide thin film formed on said buffer layer, which film has a (100) or (001) orientation, and

a ferroelectric thin film epitaxially grown on said perovskite oxide thin film.

5. (Amended) The multilayer thin film of claim 1, wherein said ferroelectric [oxide] thin film comprises PZT.

7. (Amended) A process for preparing the multilayer thin film [fabrication process by] of claim 1, comprising:

forming a buffer layer including an oxide thin film of zirconium of a rare earth element on an Si (100) substrate,

epitaxially growing a perovskite oxide thin film having a (100) or (001) orientation on said buffer layer, and

epitaxially growing a ferroelectric thin film on said perovskite oxide thin film.

8-9. (New).--